73rd MORSS CD Cover Page

UNCLASSIFIED DISCLOSURE FORM CD Presentation

712CD

For office use only 41205

21-23 June 2005, at US Military Academy, West Point, NY

Please complete this form 712CD as your cover page to your electronic briefing submission to the MORSS CD. Do not fax to the MORS office.

Author Request (To be completed by applicant) - The following author(s) request authority to disclose the following presentation in the MORSS Final Report, for inclusion on the MORSS CD and/or posting on the MORS web site.

Name of Principal Author and all other author(s):

Lee Lehmkuhl, James Przybysz

Principal Author's Organization and address:

MITRE Corp.
1155 Academy Park Loop
Colorado Springs, CO 80910

Phone: (7190 572-8307
Fax: (719) 572-8477
Email: leel@mitre.org

Original title on 712 A/B: ***A Common Foundation of Information and Analytical Capability for AFSPC Decision Making***

Revised title: N/A

Presented in (input and Bold one): (WG_**05**, CG___, Special Session ___, Poster, Demo, or Tutorial):

This presentation is believed to be:
UNCLASSIFIED AND APPROVED FOR PUBLIC RELEASE

A Common Foundation of Information and Analytical Capability for AFSPC Decision Making

Lt Col Jim Przybysz
HQ AFSPC/DDRC
Dr. Lee Lehmkuhl
HQ AFSPC/XPY (MITRE)

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
30 SEP 2005	**N/A**	**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
A Common Foundation of Information and Analytical Capability for AFSPC Decision Making	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **MITRE Corp. 1155 Academy Park Loop Colorado Springs, CO 80910**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES
See also ADM201946, Military Operations Research Society Symposium (73rd) Held in West Point, NY on 21-23 June 2005. , The original document contains color images.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**UU**	**19**	

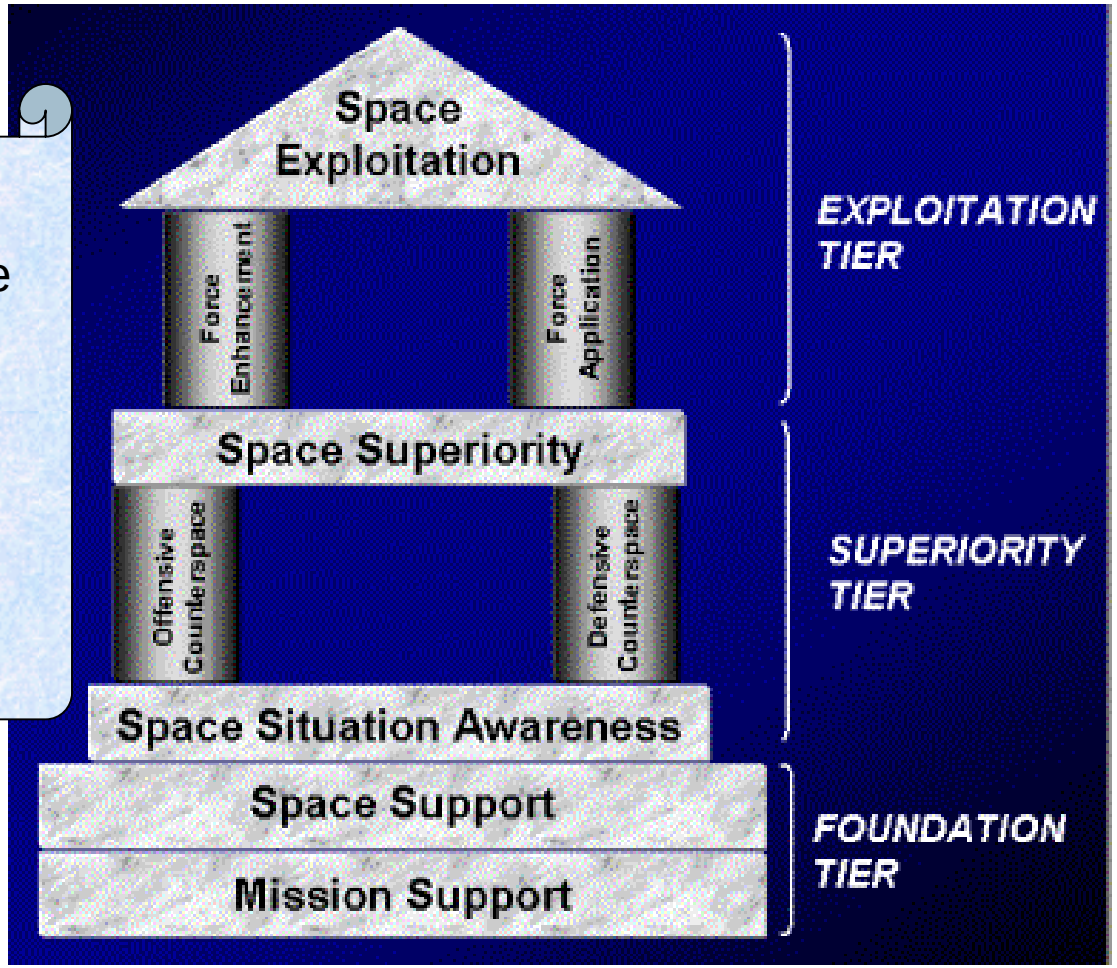
Overview

- **Space Superiority**
- **Need for Architecturally-based Analysis**
- **OV (Operational View) - 1**
- **Define Team/Process**
- **Incorporating ABR in IPP**
- **Analysis Methodology**
- **Way-Ahead/Summary**

Space Superiority

Space Superiority:

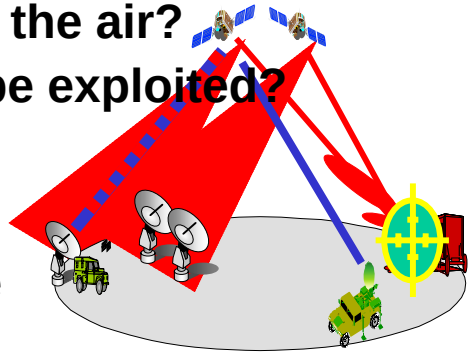
That degree of dominance in space that permits the conduct of operations by land, sea and aerospace forces at a given time and place without prohibitive interference by the opposing force. *–AFDD2*



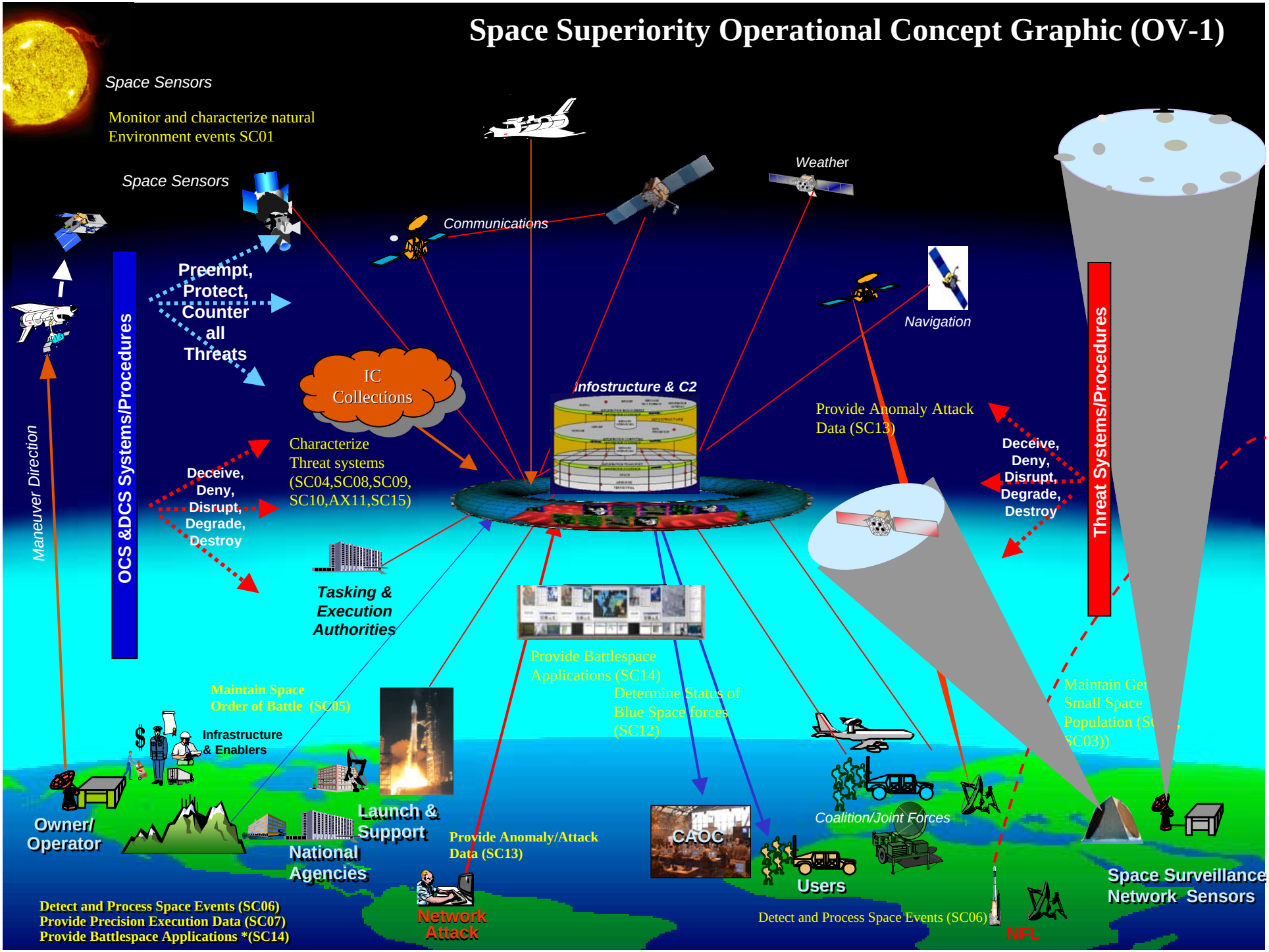
Space is no longer a sanctuary. We must architect our future to ensure we gain and maintain space superiority.

Need for Architecturally-based Analysis

- **Derive and validate functional CONOPS and requirements**
  - **Why place sensors in space? On the ground? In the air?**
  - **What are the SSA/DCS/OCS synergies that can be exploited?**
  - **What is the optimal force structure?**
- **Make investment decisions**
  - **When is a new start/mod needed and what niche does it fill in the architecture?**
  - **What are the current shortfalls? When can they be filled? What are best options?**
  - **If funding changes +/-X% what systems should be added/cut and what is the corresponding change to mission effectiveness?**
- **Evaluate joint warfighting effects**
  - **Can we deny/destroy X capability of adversary Y?**
  - **What relative value does system X provide versus system Y?**
  - **How vulnerable are we to adversary's capability X?**
  - **How does architecture stack up to current OPLANS?**

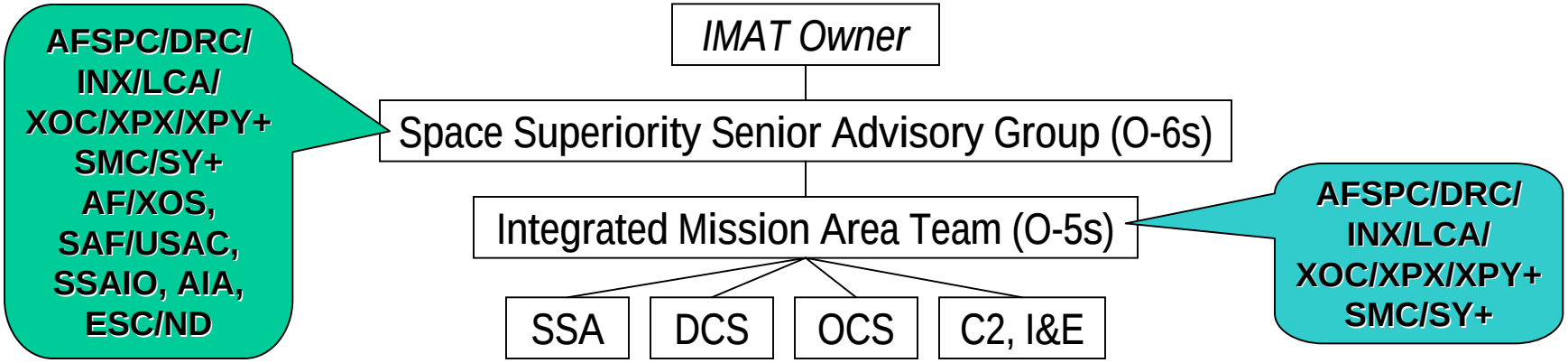


Architecture work provides the answers

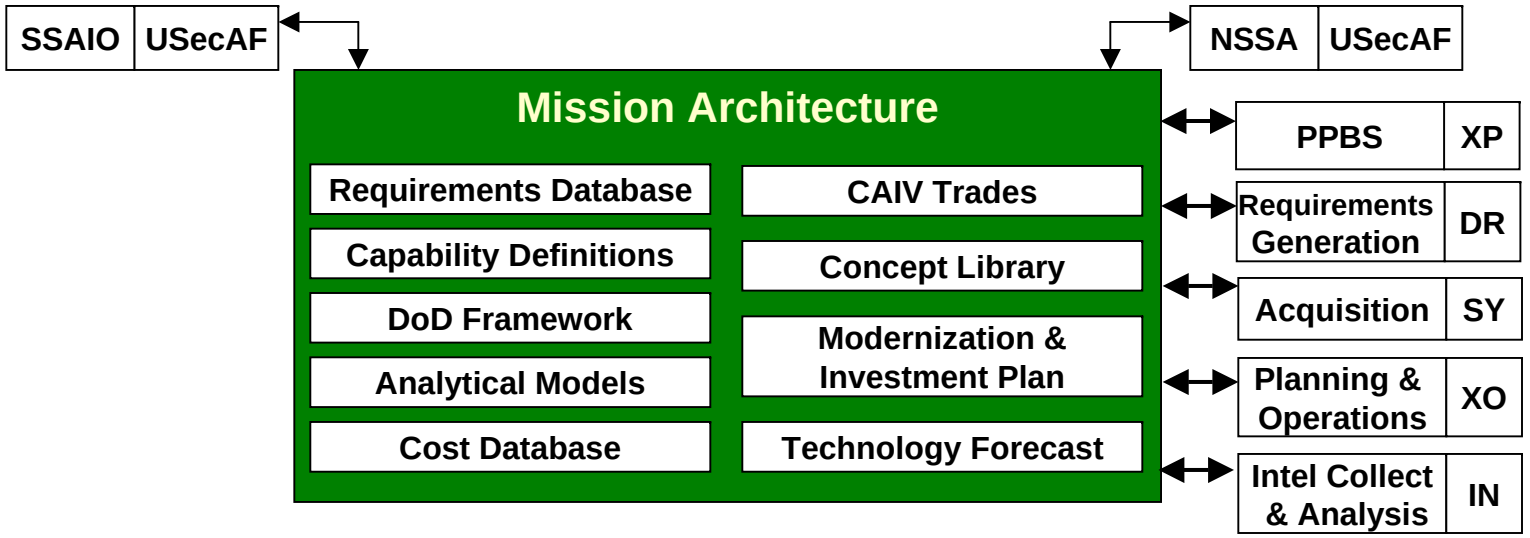

Space Superiority Operational Concept Graphic (OV-1)
Space Sensors
Monitor and characterize natural Environment events SC01
Space Sensors
Communications
Weather
Navigation
Preempt, Protect, Counter all Threats
OCS &DCS Systems/Procedures
Maneuver Direction
IC Collections
Infostructure & C2
Characterize Threat systems (SC04,SC08,SC09, SC10,AX11,SC15)
Deceive, Deny, Disrupt, Degrade, Destroy
Tasking & Execution Authorities
Provide Anomaly Attack Data (SC13)
Deceive, Deny, Disrupt, Degrade, Destroy
Threat Systems/Procedures
Provide Battlespace Applications (SC14)
Determine Status of Blue Space forces (SC12)
Maintain Space Order of Battle (SC05)
Infrastructure & Enablers
Owner/ Operator
Launch & Support
National Agencies
Provide Anomaly/Attack Data (SC13)
Network Attack
CAOC
Coalition/Joint Forces
Users
Detect and Process Space Events (SC06)
NFL
Space Surveillance Network Sensors
Detect and Process Space Events (SC06)
Provide Precision Execution Data (SC07)
Provide Battlespace Applications *(SC14)

Architecture Baseline Review

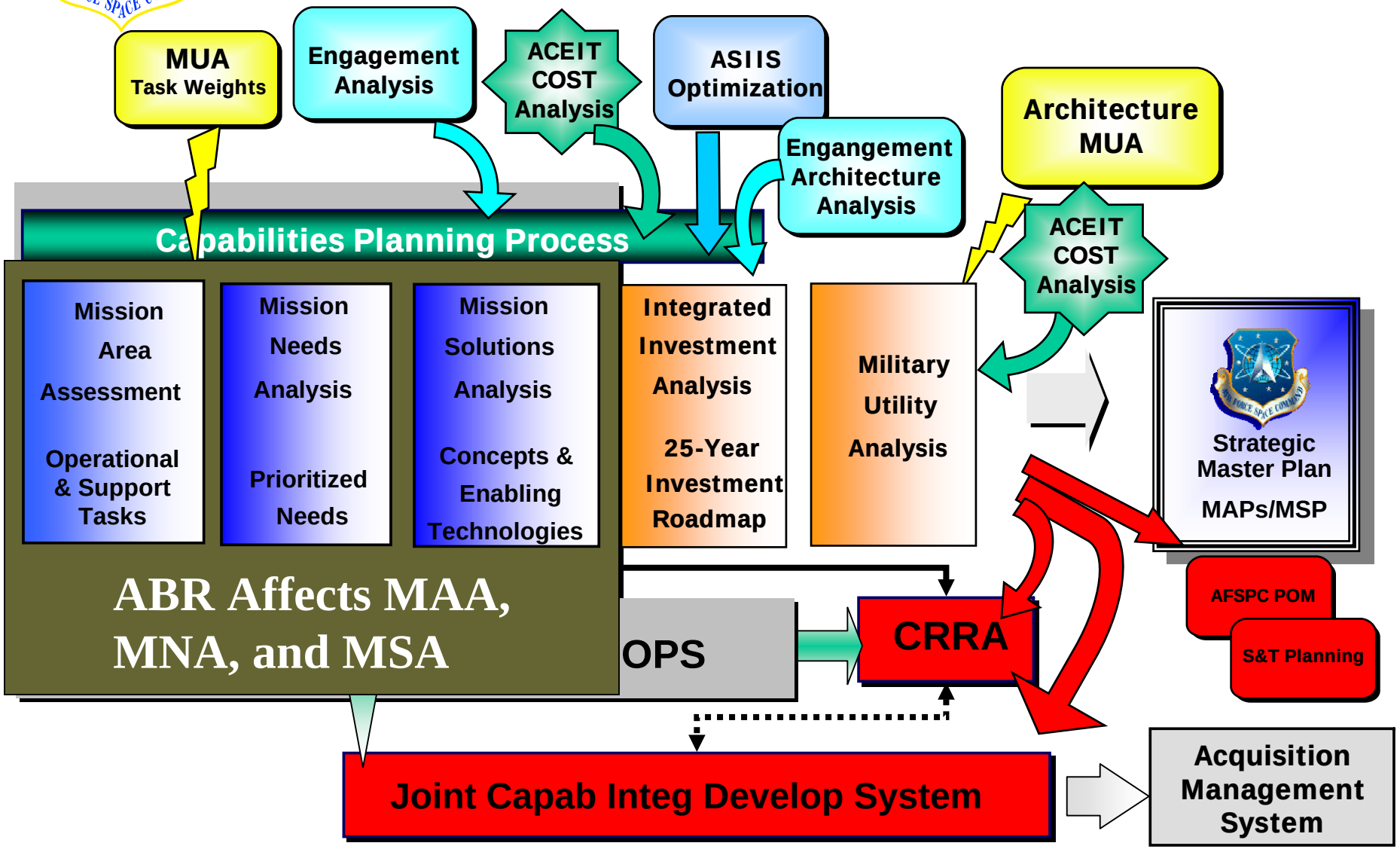
Integrated Mission Area Team to Control Process



All Stakeholders Using a Single Data Repository

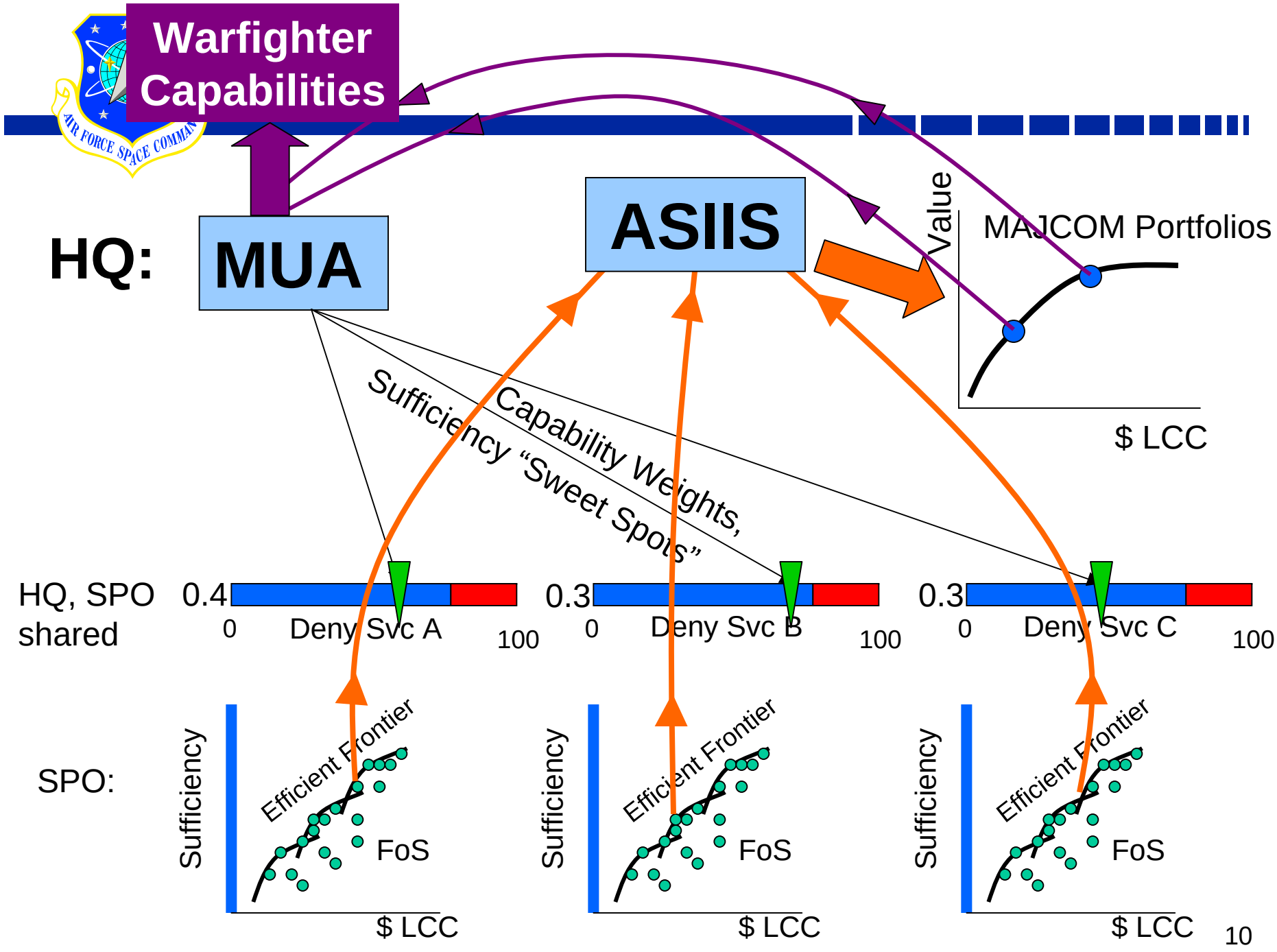


AFSPC Counterspace Planning



Incorporating ABR into AFSPC Planning

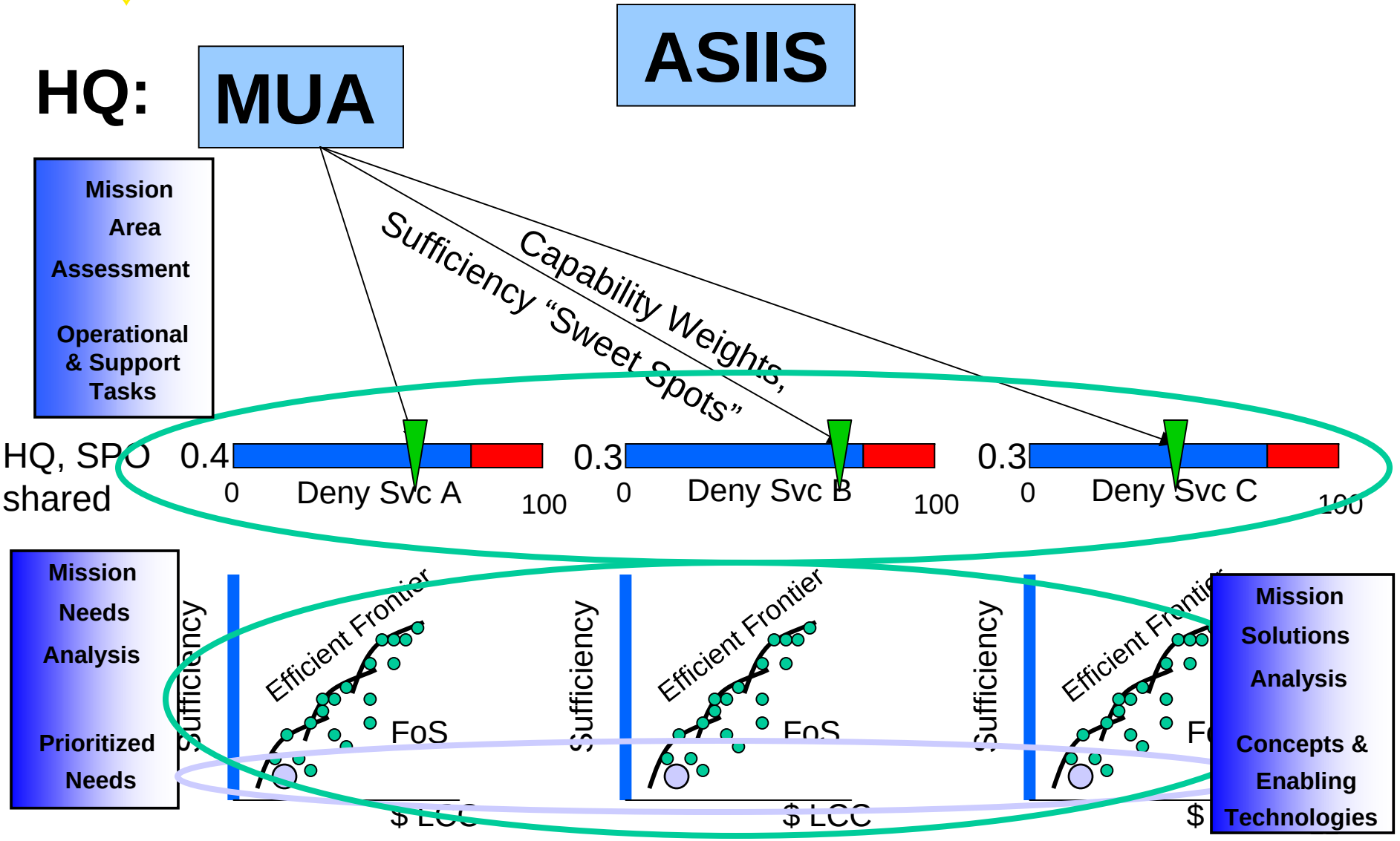
- **Collaborative Effort**
  - **SPO**
  - **Planners**
  - **Analysts**
- **Consensus on Organizational Strengths**
  - **IPP foundation for Corporate Process**
  - **SPO engineering analysis ideal for FoS scoring**
  - **DODAF products for documentation**
- **Analysis framework builds consensus**


Warfighter Capabilities
HQ:
MUA
ASIIS
Value
MAJCOM Portfolios
$ LCC
Capability Weights,
Sufficiency "Sweet Spots"
HQ, SPO shared
0.4
0
Deny Svc A
100
0.3
0
Deny Svc B
100
0.3
0
Deny Svc C
100
SPO:
Sufficiency
Efficient Frontier
FoS
$ LCC
Sufficiency
Efficient Frontier
FoS
$ LCC
Sufficiency
Efficient Frontier
FoS
$ LCC

ABR Affects MAA, MNA, MSA

HQ: **MUA**

ASIIS



Calculating FoS Capability

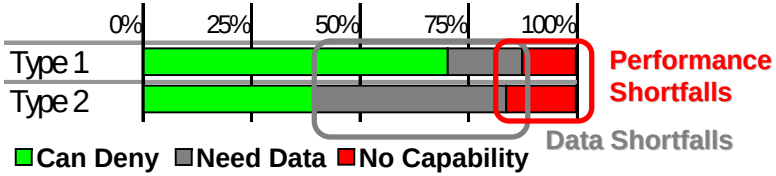
1) Determine 1-on-1 capability for each concept

Potential capability to deny, 1-v-1		Concept 1	Concept 2	Concept 3	Concept 4	Concept 5	Concept X	Need Data	Total
Threat type 1	Target 1	50%	100%	0%	50%	0%	100%	0%	4
	Target 2	50%	100%	0%	50%	0%	100%	0%	4
	Target 3	50%	50%	0%	50%	0%	88%	0%	16
	Target 4	50%	50%	0%	33%	0%	100%	0%	8
	Target 5	50%	50%	0%	33%	0%	100%	0%	8
	Target 6	50%	33%	0%	33%	0%	92%	0%	8
	Target 7	50%	33%	0%	13%	0%	33%	50%	6
	Target 8	13%	50%	0%	13%	0%	33%	50%	6
	Target 9	13%	25%	0%	0%	0%	25%	50%	6
	Target 10	0%	0%	0%	0%	0%	0%	50%	6
Threat type 2	Target 1	0%	0%	50%	0%	0%	50%	50%	8
	Target 2	0%	0%	0%	0%	0%	0%	50%	6
	Target 3	0%	13%	38%	0%	13%	50%	50%	8
	Target 4	0%	0%	33%	0%	0%	33%	50%	6

2) Summarize FoS capability
- Determine FoS capability shortfalls

→ FoS TPM

FoS Capability:



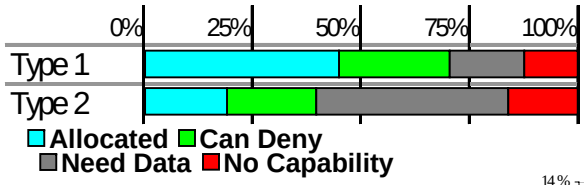
3) Allocate systems to threats in the scenario
- Determine FoS capacity against threat

Allocate Capacity to deny target capability		Concept 1	Concept 2	Concept 3	Concept 4	Concept 5	Concept X	Capacity	Total
Threat type 1	Target 1		1					4	4
	Target 2		1					4	4
	Target 3		1		1			12	16
	Target 4				1			3	8
	Target 5						1	2	8
	Target 6				1			3	8
	Target 7				1			1	6
	Target 8	1						3	6
	Target 9							0	6
	Target 10							0	6
Threat type 2	Target 1			1				4	8
	Target 2							0	6
	Target 3					1		1	8
	Target 4							0	6
Number Allocated		1	3	1	4	1	1	37	
Number Available		1	3	1	4	1	1		

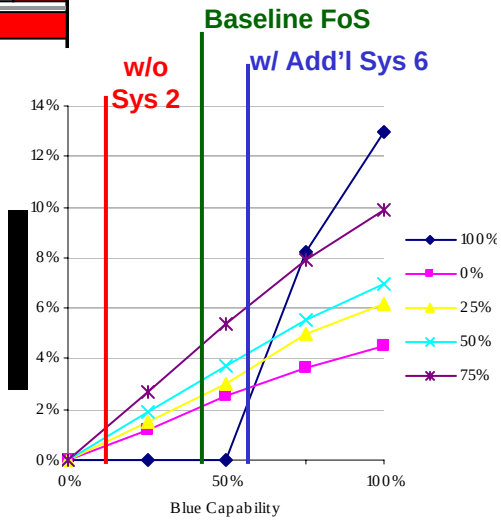
4) Summarize FoS capacity
- Determine FoS sensitivity to capacity

→ FoS TPM

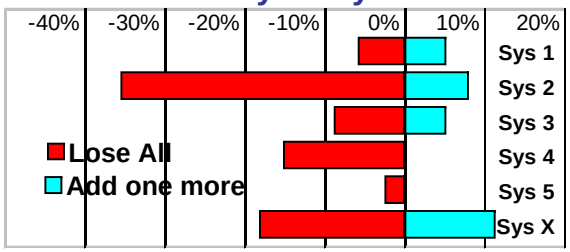
FoS Capacity:



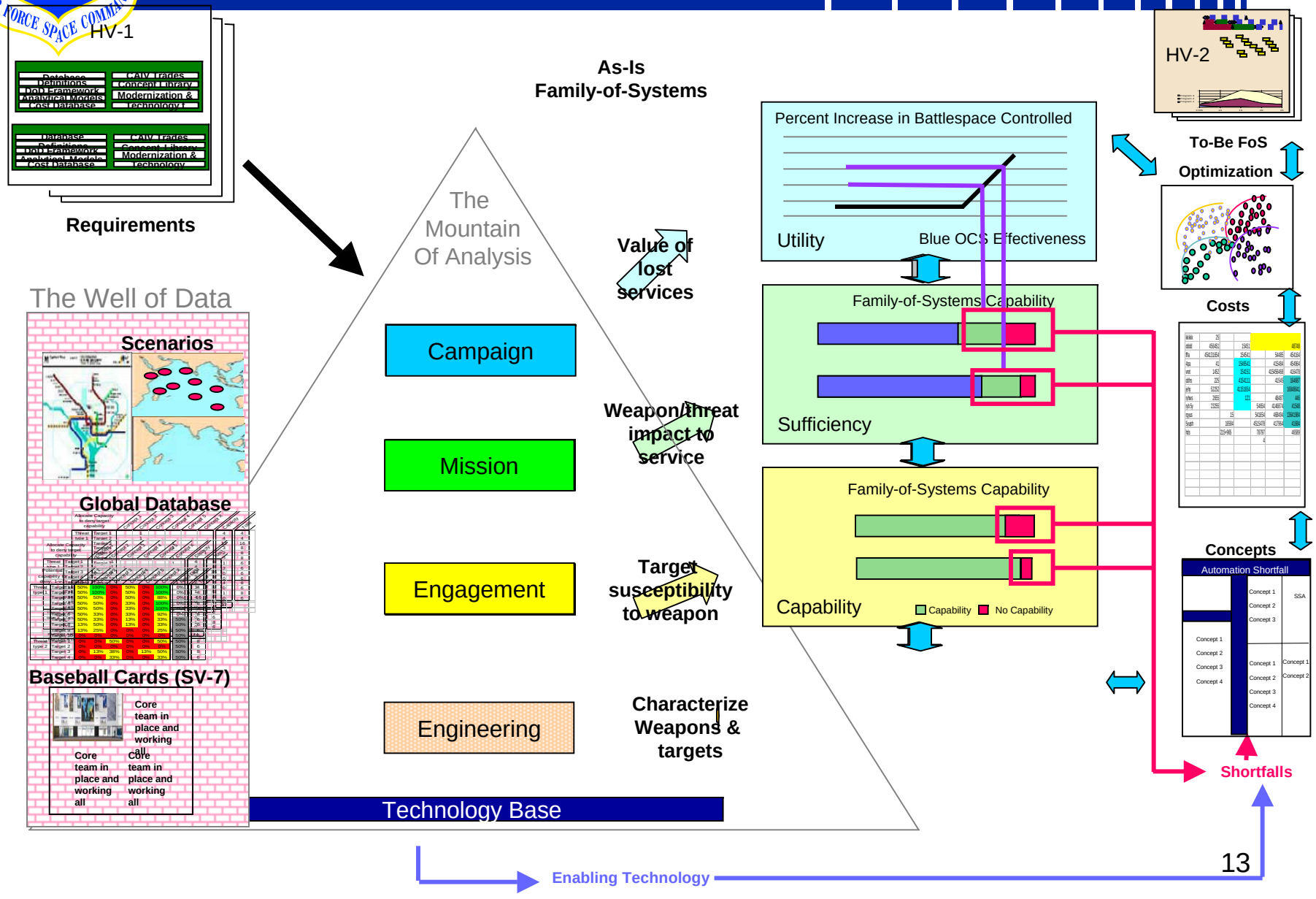
Example FoS Utility Analysis



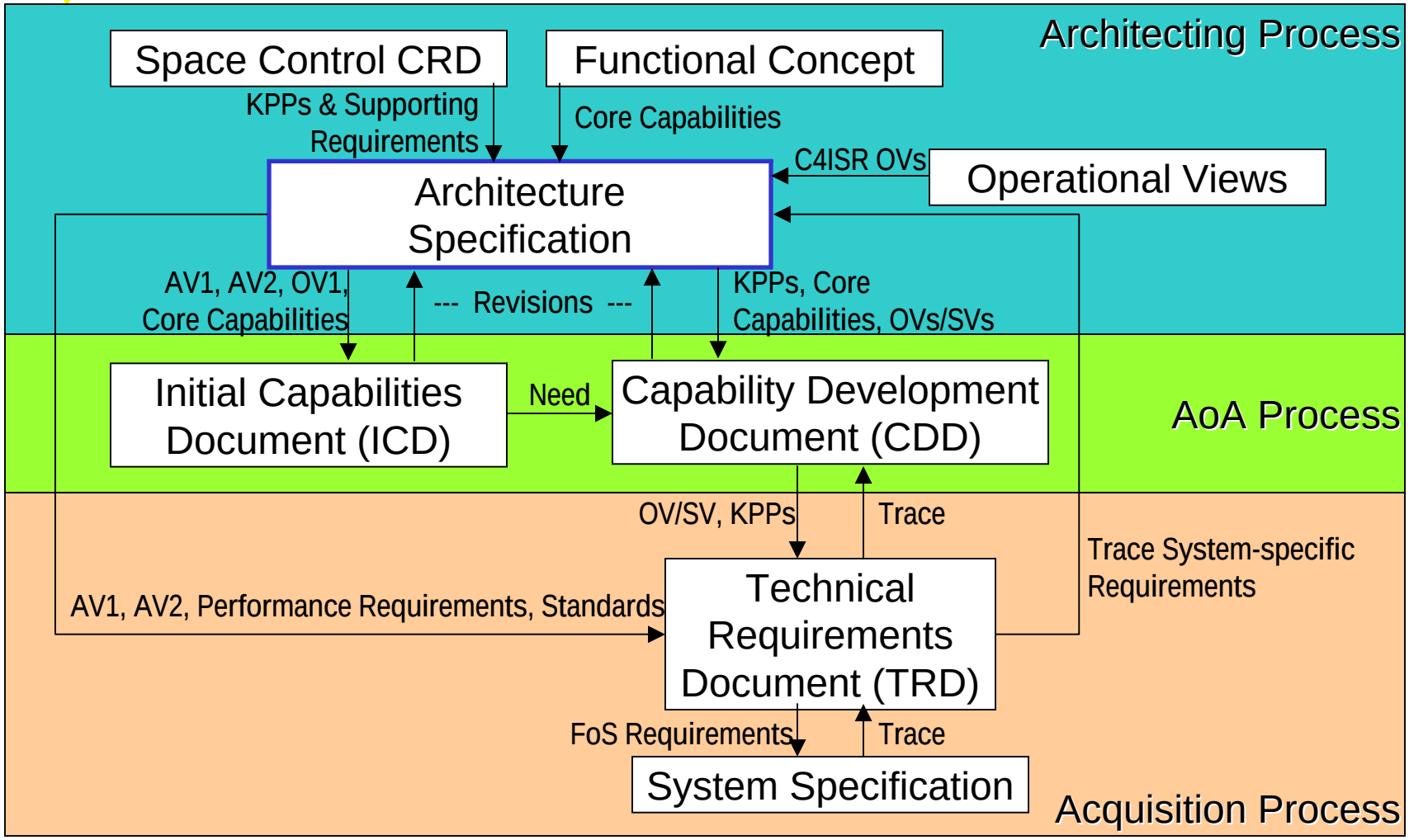
Force Sensitivity Analysis



Architecture Analysis Methodology



Architecture Specification Ties it Together



Scorecard

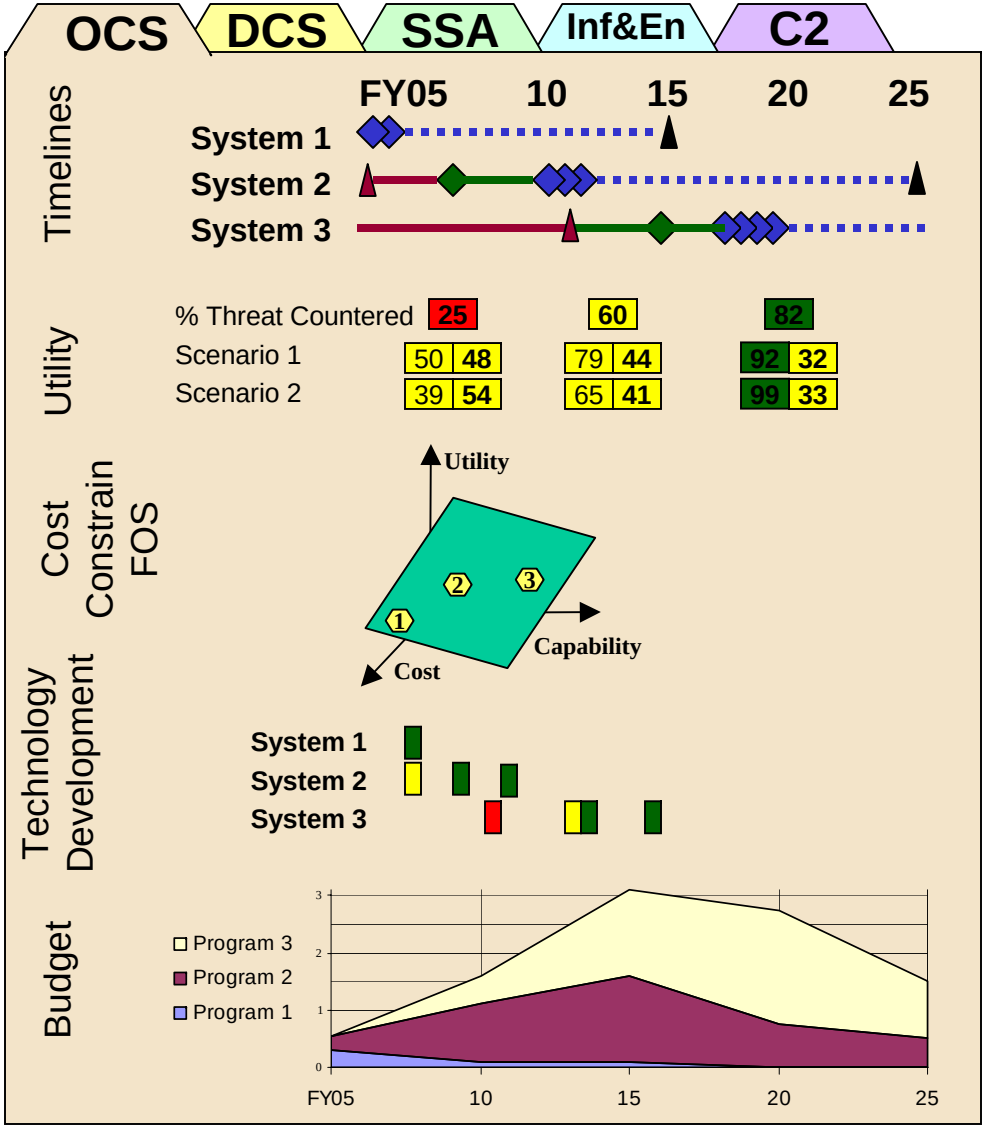
What Systems When

How it Affects Mission

Why These Systems

Key Technology Maturation Gates

Funding Profile



Way Ahead

- **Mid 2005**

	Now	Mid	Far
FoS ➔	OPLAN ➔	MCOs ➔	MCOs

Supports:
FY06-FY11
POM

MUA

- **Beyond**
  - **Campaign model transition**
  - **Expansion to all AFSPC Mission Areas**

Summary

- Core team in place and working all mission areas
- Merging process into AFSPC Integrated Planning Process
- Pathfinder for overall MAJCOM Corporate Process
- OCS
  - Refining evaluation process to make as relevant as practical to Ops Planning
  - Defining concepts sufficiently to enable effectiveness and cost analysis to identify optimal cost-constrained FoS
  - Other service/agency options can be included
- Analyze DCS similarly, only blue “targets” and red weapons – intel-dependent
- SSA is tougher
  - Using AFSPC/XPY SSA value model and SSNAM simulation
  - Linking SSA performance to weapon system performance

Back up charts

Arch Spec. – Database of FoS Info

Architecture Specification

C4ISR Items	Database Contents	Other Items
AV 1 →	1.0 Overview and Summary	← Scenario Documentation
	2.0 Applicable Documents	← Policies and References
OVs →	3.0 Capability Definitions and Operational Views	← Functional Concept & Maps
SVs 1-6, 11 →	4.0 Performance Characteristics and System Views	← Target list & MOE/MOPs
TV-1,2 →	5.0 Standards	← Environmental, Transportability, Design/Construction, IA, Logistics, Personnel/Training
SV-7 →	6.0 System Specific Requirements	
	7.0 Verification and Preparation for Delivery	← Responsibilities and Procedures
	8.0 Architecture Evolution	← HV-1 and HV-2
AV-2 →	9.0 Integrated Dictionary	